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|---|-------------|----------------------|---------------------|------------------|
| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 09/931,962  | 08/16/2001  | Yoshio Fukuhara      | 70840-56398         | 5416             |
| 21874   | 7590        | 10/01/2004           | EXAMINER            |                  |
| EDWARDS & ANGELL, LLP<br>P.O. BOX 55874<br>BOSTON, MA 02205 |             |                      | WONG, ALLEN C       |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2613                |                  |

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/931,962

Applicant(s)

FUKUHARA ET AL.

Examiner

Allen Wong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/9/03, 12/10/03, 3/17/04, 6/4/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Information Disclosure Statement*

The information disclosure statements (IDS) submitted on 11/07/01, 12/10/03, 3/17/04 and 6/4/04 have been considered by the examiner. The submission is in compliance with the provisions of 37 CFR 1.97.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korein (6,226,035) in view of Geng (6,304,285).

Regarding claim 1, Korein discloses a moving object tracking apparatus for detecting and tracking one or more moving objects in an environment, comprising:

an optical system including a hyperboloidal mirror for capturing visual field information (col.9, ln.29-34; fig.1, note optical system 10 can replace the mirror 12 with a hyperbolic or hyperboloidal mirror for capturing visual field of the wide angle image data);

a single stationary camera for converting the captured visual field information to image information (fig.1, element 20); and

an information processing section for processing the image information (fig.1, element 106 is the computer that processes the captured image information, col.11, ln.48 to col.12, ln.6),

wherein the information processing section detects and tracks the one or more moving objects based on the image information (col.12, ln.37-41 discloses that objects can be tracked, thus the object is detected; and col.13, ln.48-57, Korein discloses that motion detectors can be applied to the captured image information for tracking purpose).

Korein does suggest that omni-directional imaging system can be constructed using a camera, a parabolic mirror and a telecentric lens (col.9, ln.50-51), and also, that a hyperbolic mirror is used in Korein's wide-angle optical system (col.9, ln.29-34). Although Korein does not specifically disclose hyperboloidal mirror for capturing visual field information on a 360 degrees environment, however, Geng discloses that a hyperbolic mirror can be used for capturing the visual field information omni-directional image data on a 360 degrees environment (see fig.4 and col.4, ln.29-37; note the omni-mirror can be a hyperbolic mirror to capture the omni-directional or all direction view or 360 degrees environment view of the scene, and that, the hyperbolic mirror is below the CCD camera to optimally capture images of a 360 degrees environment or panoramic scene). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Korein and Geng, as a whole, for capturing

omnidirectional three dimensional images to accomplish practical tasks, ie. object detection and tracking, that require simultaneous 360 degree viewing angle and three dimensional measurement capabilities (Geng col.3, ln.1-4).

Regarding claim 2, Korein discloses wherein: the image information includes all-direction image information (col.9, ln.50-56); and the information processing section converts at least a portion of the all-direction image information to panoramic image information (col.2, ln.6-11 and col.9, ln.50-56).

Regarding claim 3, Korein discloses wherein the information processing section provides a marker to each of the one or more moving objects in the panoramic image information (col.12, ln.65 to col.13, ln.6 and col.13, ln.39-45).

Regarding claim 4, Korein discloses wherein the information processing section provides a marker to each of the one or more moving objects depending on a size of each of the one or more moving objects (col.12, ln.65 to col.13, ln.6 and col.13, ln.39-45).

Regarding claim 5, Korein discloses wherein: the image information includes all-direction image information (col.9, ln.50-56); and the information processing section converts at least a portion of the all-direction image information to perspective projection image information (col.2, ln.6-11 and col.9, ln.50-56, note panoramic image data produced is the perspective image information).

Regarding claim 6, Korein wherein the information processing section processes the image information using a previously prepared table (col.13, ln.58 to col.14, ln.63; note Korein discloses that the image information can be obtained by using stored data

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in the tables, ie. the mathematical formulas for conversion processes of image data from spherical coordinates to Cartesian coordinates, so that one can facilitate image reproduction).

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korein (6,226,035), Geng (6,304,285) and in view of Matsuda (5,953,449).

Regarding claim 7, Korein and Geng do not specifically wherein the information processing section processes the image information using only one kind of data out of RGB data in the image information. However, Matsuda teaches the use of the RGB data from the image information to utilize and calculate color values during image processing (col.9, ln.20-22). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Korein, Geng and Matsuda, as a whole, for easily measuring color information of the RGB data in an accurate manner so as to enhance displaying image data (col.3, ln.59-64).

4. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korein (6,226,035), Geng (6,304,285) and in view of Lee (5,787,199).

Regarding claim 8, Korein discloses a motion detector to detect the motion of a target (col.13, ln.48-57). Korein and Geng do not specifically disclose wherein the information processing section detects the one or more moving objects based on a brightness difference between predetermined frame information and frame information previous to the predetermined frame information of the image information. However, Lee teaches wherein the information processing section detects the one or more moving objects based on a brightness difference between predetermined frame

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information and frame information previous to the predetermined frame information of the image information (col.2, ln.62 to col.3, ln.7). Therefore it would have been obvious to one of ordinary skill in the art to combine the teachings of Korein, Geng and Lee, as a whole, for determining whether the object belongs in the foreground or background region, and for clearly distinguishing the objects within a picture (Lee col.1, ln.54-56). Doing so would improve the encoding of the image information while maintain high image quality and accuracy.

### ***Contact Information***

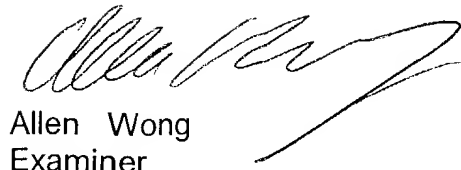
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (703) 306-5978. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Kelley can be reached on (703) 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Allen Wong', with a long, sweeping horizontal stroke extending to the right.

Allen Wong  
Examiner  
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AW  
9/29/04